CENTRONICS [PARALLEL] PRINTER INTERFACE

MODEL CP2068

INSTRUCTIONS

AERCO

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Welcome to the **AERCO** Centronics Interface for the Timex 2068 computer.

The interface board plugs into the back of the 2068. Be sure the power switch on the computer is turned **OFF** before installing the interface. The connector at the end of the cable plugs into the Centronics [Parallel] port on your printer.

CAUTION DO NOT REMOVE OR INSTALL INTERFACE WITH POWER ON!

The cassette tape contains a program that allows printing from **LPRINT** and **LLIST**. If you have a dot matrix printer with bit mapped graphics, you can also COPY the screen by using the command **LPRINT CHR$ 1**.

GETTING STARTED:
1. Switch **OFF** your computer and printer.
2. Attach the board to the rear connector of the computer. Be sure the keyway lines up on the connector.
3. Attach the ribbon cable connector to the Centronics port of your printer.
4. Switch **ON** the computer and enter the command: **LOAD** ""
5. Insert the print driver tape in your cassette deck.
6. Start playing the tape and press **ENTER**.

When the tape has loaded, you will see the following menu:

```
           CENTRONICS PRINT DRIVER
               is now loaded

        * * * * PRESS a KEY * * * * *


     C  Customize  Do this first


     E  Exit to BASIC


     L  Load your program from tape


     N  Notes on Operation


     P  Printer demonstration


     S  Save on tape
```

Explanation of Commands

Customize modifies the bit mapped graphics mode for your particular make of printer. Press C and you will see notes on screen copy. Press any key again and you will see a table of the most popular printers. Select the number corresponding to your printer. If you do not see your printer, try all of the selections.

NOTE: The Customize selection can be changed anytime. It remembers the last one.

NOTE: The Customize selection is only required for SCREEN COPY. It does not affect LLIST or LPRINT.

Exit to BASIC allows you to enter programs and commands as you normally would.

Load your program from tape allows you to merge your program with the print driver.
1. Load the print driver tape as before.
2 Insert your program tape in cassette deck.
3. Press the L key
4. Start the tape and press any key.

Notes on Operation explains some of the operating details. Press any key to see the next screen. It will return to the menu when completed.

Printer demonstration is a sample program to exercise your printer.
1. Press the P key.
2. Enter the print width you want.

Save on tape allows you to copy the print driver. Be sure to make a copy of the original tape as well as your customized version. The print driver is loaded once at the start of both sides of the original tape.
1. Insert a fresh tape in the deck.
2. Press the S key.
3. Start the tape in record and press any key.

NOTE: The print driver tape saves in [2] sections. At the end of the first section, it pauses to request you to press any key before completing the second section.

Test your system by pressing P to send the sample text to your printer. You will have to specify the number of characters you wish on the print line.

Print width: You can adjust the number of characters any time with this command
POKE 64459, width-1

If your printer is printing everything on one line, you must tell the software to send a line feed after every carriage return with **POKE 64460,10**

If the printer only prints on every other line, POKE 64460,0

Printer Command Codes: Most printers accept special commands for functions such as double width charactors or underline. To send command codes to the printer you must enter the LITERAL MODE. The LITERAL MODE ignores the single keywords [PRINT,GOTO,etc] and sends the charactor directly thru the interface to the printer. If you want keywords to show in an LLIST, you must return to the **EXPANDING MODE**. The EXPANDING MODE is the normal state when you load the system. The printer will remember command codes until you change them or do a power reset.
1. POKE 64456,0   this enters the LITERAL MODE
2. LPRINT CHR$ x; CHR$ y; CHR$ z

The z,y,z charactors can be entered in [2] ways:
1. The decimal value of the ASCII code preceded by CHR$ (CHR$ 81)
2. The ASCII charactor itself between quotes, <u>if</u> it appears on the
   keyboard ("Q")

For example; if the command for Compressed Pitch is ESC Q
POKE 64456,0
LPRINT CHR$ 27; **CHR$** 81
        OR
LPRINT CHR$ 27; "Q"

NOTE: The command may need to be terminated with a semi-colon
       (to disable carriage return) LPRINT CHR$ 27; "Q" ;

Refer to the ASCII Conversion Chart to find the various codes.

POKE 64456, 1   to return to the EXPANDING. MODE.

Test your printer's command codes. Perform steps 1&2. Enter LLIST to have your printer list the program. Compare the different formats.

As you acquire software programs, you might want to make a permanent merge with the print driver. Then you will only have to load one program.

1. LOAD the print driver cassette. Press E to enter BASIC.
2. DELETE [SHIFT 0] 1, 9981   This eliminates the demo and notes.
3. Add the following line to the program: 9993 LOAD ""
4. Insert a fresh tape in your recorder, select Record and enter GOTO 1.
5. Press any key when instructed to do so.
6. When the report appears on the screen, stop the tape and remove it.
7. Put your program tape in the recorder and enter LOAD   ""
8. When the program loads, change all entries of COPY to LPRINT CHR$ 1.
9. Remove your program tape and exchange it with the tape just made of the print driver code.
10 Enter SAVE ["name" LINE X] *the first line of your program.*
   SAVE ["WP" LINE 1]

NOTE: "name" must occupy at least one space. Even if it is blank.

If the LLIST command develops an <u>uninvited</u> *Copy* of the screen:
POKE 64463,0
POKE 64464,0
POKE 64465,0

LPRINT CHR$ 1 must now be replaced by:
RAND USR 65006 for the <u>OLIVETTI ink jet printer</u>
RAND USR 64844 for <u>all other printers</u>

If you encounter problems, look for obvious solutions:
1. Inspect the connections to the computer and printer.
2. Inspect the interface board and cable for visual defects.
3. Verify that you have followed the directions without mistake
4. Insure that the printer is online.
5. Look for clues in the program listings.
6. Enter GOTO 1 to return to the menu.

If you continue to have problems, call or write us and we will do our best to assist in any way we can. It is our intent to provide the best possible product and support. Please understand that we might be hard pressed to provide immediate aid for one of a kind problems.

AERCO PRINTER INTERFACE CHARACTERS

DECIMAL	ASCII	DECIMAL	ASCII	DECIMAL	ASCII
000	NUL	041	)	082	R
001	SOH	042	*	083	S
002	STX	043	+	084	T
003	ETX	044	,	085	U
004	EOT	045	-	086	V
005	ENQ	046	.	087	W
006	ACK	047	/	088	X
007	BEL	048	0	089	Y
008	BS	049	1	090	Z
009	HT	050	2	091	[
010	LF	051	3	092	/
011	VT	052	4	093	]
012	FF	053	5	094	^
013	CR	054	6	095	_
014	SO	055	7	096	
015	SI	056	8	097	a
016	DLE	057	9	098	b
017	DC1	058	:	099	c
018	DC2	059	;	100	d
019	DC3	060	<	101	e
020	DC5	061	=	102	f
021	NAK	062	>	103	g
022	SYN	063	?	104	h
023	ETB	064	@	105	i
024	CAN	065	A	106	j
025	EM	066	B	107	k
026	SUB	067	C	108	l
027	ESC	068	D	109	m
028	FS	069	E	110	n
029	GS	070	F	111	o
030	RS	071	G	*ETC...*	
031	US	072	H		
032		073	I	119	w
033	!	074	J	120	x
034	"	075	K	121	y
035	#	076	L	122	z
036	$	077	M	123	{
037	%	078	N	124		
038	&	079	O	125	}
039	'	080	P	126	~
040	(	081	Q	127	DEL

AERCO

ACME ELECTRIC ROBOT CO.

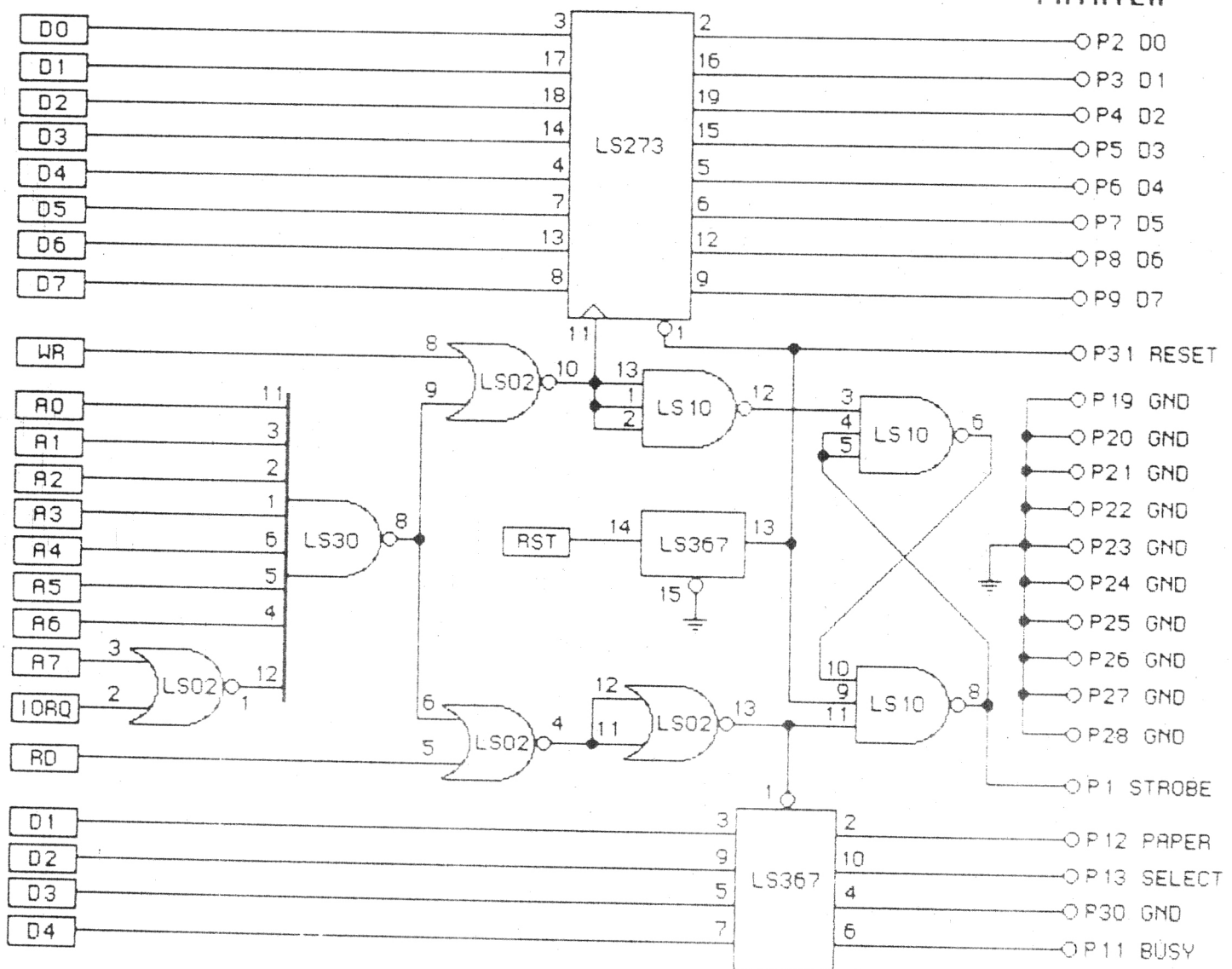Box 18093 Austin, TX 78760

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MODULAR INTERFACE FOR TSC COMPUTERS
CP-ZX V.3 CENTRONICS PRINTER INTERFACE
TS1000, TS1500, TS2068

COMPUTER

PRINTER

The I/O Port Identity of this board is 7F HEX (127 Decimal). A byte is sent to the printer by writing it to the port. The status of the printer is determined by reading the port. The Printer Strobe is generated by reading the port immediately after writing to it.

Welcome to the AERCO Centronics interface for the Timex 2068 computer.

The interface board plugs into the back of the 2068. Be sure the power switch on the computer is turned OFF before installing the interface. The connector at the end of the cable plugs right into the Centronics connector on your printer.

The cassette tape contains a program that allows printing from LPRINT and LLIST. If you have a dot matrix printer with bit mapped graphics, you can also COPY the screen by using the command LPRINT CHR$ 1 Load the tape into the computer by typing LOAD "" When the tape has loaded you will find the following menu on the screen:

* * * * * PRESS A KEY * * * * * * * * * PRESS A KEY * * * * *

C Customise   E Exit to BASIC   L Load your program from tape

N Notes on operation   P Printer demonstration   S Save on tape

If you have a dot matrix pinter with bit mapped graphics you can COPY the screen onto the printer. Since the graphics commands are different for various printers, you must customize the program for the type of printer you have. Press the C key and the program will allow you to specify your brand printer.

TEST your customised tape by pressing P to send sample text to the printer. You will be asked to specify the number of characters you wish in each print line. You can change the print width at any time with POKE 64259, width-1 If your printer is printing everything on one line, you must tell the software to send a line feed after every carriage return with POKE 64260, 10 If your printer is only printing on every other line, you must suppress that line feed with POKE 64260, 0 After you have customized the program for your printer, you should SAVE it on a different cassette. Do this by pressing the S key from the menu.

PRESS N for additional NOTES on operations with the printer.

How to add the print driver to your existing tape programs:

1. LOAD the print driver cassette. Press E to exit to BASIC
2. DELETE (Shift 0) 1, 9981
3. Add the following line to the program: 9993 LOAD ""
4. Insert a fresh tape in the recorder, select RECORD and GOTO 1
5. Press any key when instructed to do so.
6. When the report appears on the screen, stop the tape and remove it.
7. Put your program tape in the recorder and LOAD ""
8. When your program loads, change all occurences of COPY to LPRINT CHR$ 1
9. Remove your program tape and replace the tape you saved the print driver on in the recorder. Start the recorder in RECORD.
10. SAVE "name" LINE start line #
11. You now have a program tape complete with print driver.

NOTE on LLIST There is a bug in the 2068 than can cause an uninvited copy of the screen to appear in your listings. To eliminate this problem: POKE 64263, 0 POKE 64264, 0 POKE 64265, 0 and copy the screen with RAND USR 64628

ADDITIONAL OPERATING NOTES

PRINTER COMMANDS :

To send control commands to your printer, go to the LITERAL MODE and enter the characters in the following format:

1. POKE 64256,0   to enter the LITERAL MODE
2. LPRINT CHR$ (   ); CHR$ (   ); CHR$ (   );

do <u>not</u> include the (   ) in your command
Refer to appendix B of the T/S user manual or a complete ASCII code chart for the <u>decimal</u> code of ASCII characters.

ie 33= !
    65= A= "A"
    27= ESC

characters found on the T/S keyboard can be entered between quotes: "A"

Remember that Keyword Commands (PRINT) are ignored by the computer in LITERAL MODE To return to the NORMAL or EXPANDED MODE, POKE 64256,1

The printer will remember commands until you return to the LITERAL MODE and change them.

TAPE MERGE

If you have a loop problem when merging the print driver with existing tape programs, insert the following command after step #3:

9988 STOP

this will prevent the " start tape " message from continuously repeating

HELP

If you get "lost" or in a "hole" try GOTO 1 to get back to the menu.

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** RELOCATABLE AERCO PRINT DRIVER **
version 4

Load the program supplied with LOAD "".

The program will load in two parts. The BASIC portion will load
the 800-byte driver at Loc 64000 so that you may customize and
save it. Your customized driver may then be loaded at any
reasonable base address with the command LOAD "" CODE base.

Customization simply means selecting two initial print
parameters (width and linefeed-switch) and specifying your
printer type. The printer type is relevant only for the COPY
function.

If your printer does not have bit-image capabilities, it cannot
copy the screen. Most (but not all) dot-matrix printers have
bit-image capability; Daisywheel printers do not. LPRINT and
LLIST only will work on such printers.

If your printer has bit-image capability and is NOT on the list
of printer types, try selecting various printer types and
testing it. If you find a type that works, RELOAD the program
from scratch, select the type that works, and then save your
customised driver. If you do NOT find a type that works, contact
AERCO for assistance.

USING THE CUSTOMIZED DRIVER

Let us say you want to put the driver at Location 55000. The
"base" would be 55000. "(base+2)" would be 55002 and so on.

CLEAR (base-1) ....ENSURES THAT BASIC WILL NOT HURT THE DRIVER

LOAD "" CODE base ....LOADS THE DRIVER

RANDOMIZE USR base ....TURNS THE DRIVER ON

RANDOMIZE USR (base+2) ....TURNS THE DRIVER OFF

RANDOMIZE USR (base+450) .....COPIES THE SCREEN
    -but for PR2300 Printer, use (base+612)

POKE (base+4), (width-1) .....CHANGES LINE WIDTH
   -Example: POKE 55004,79 sets 80-Column width

POKE (base+5),10 ....LINEFEED ON

POKE (base+5),0 ....LINEFEED OFF

PR2300 PRINTER ZOOM ON/OFF........ POKE (base+586),27/0
                                   POKE (base+587),47/0

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UPDATED VERSION

** MTERM SMART II patch for AERCO I/F **

** Changes at 58755 to 58772, resolve problem with 'connect'. Jan. 20 1985 **

To install the patch to your program, load your MTERM SMART II PROGRAM,
POKE the following data into the locations listed and SAVE the program using:
   SAVE"patch"CODE 54016,7721

Some BASIC help; Enter the data into DATA lines and use loop to POKE locations.

```
POKE 59173,195   POKE 59174,126   POKE 59175,229
POKE 59188,195   POKE 59189,178   POKE 59190,229
POKE 58618,42    POKE 58619,23    POKE 58620,238   POKE 58621,237   POKE 58622,75
POKE 58623,236   POKE 58624,238   POKE 58625,3     POKE 58626,125   POKE 58627,185
POKE 58628,32    POKE 58629,7     POKE 58630,124   POKE 58631,184   POKE 58632,32
POKE 58633,3     POKE 58634,195   POKE 58635,80    POKE 58636,229   POKE 58637,62
POKE 58638,127   POKE 58639,219   POKE 58640,254   POKE 58641,31    POKE 58642,210
POKE 58643,80    POKE 58644,229   POKE 58645,219   POKE 58646,127   POKE 58647,230
POKE 58648,16    POKE 58649,32    POKE 58650,242   POKE 58651,126   POKE 58652,254
POKE 58653,10    POKE 58654,32    POKE 58655,2     POKE 58656,62    POKE 58657,0
POKE 58658,254   POKE 58659,12    POKE 58660,32    POKE 58661,2     POKE 58662,62
POKE 58663,0     POKE 58664,205   POKE 58665,48    POKE 58666,229   POKE 58667,35
POKE 58668,195   POKE 58669,2     POKE 58670,229   POKE 58671,0     POKE 58672,211
POKE 58673,127   POKE 58674,0     POKE 58675,219   POKE 58676,127   POKE 58677,201
POKE 58678,0     POKE 58679,0     POKE 58680,0     POKE 58681,0     POKE 58682,0
POKE 58683,0     POKE 58684,0     POKE 58685,0     POKE 58686,0     POKE 58687,0
POKE 58688,0     POKE 58689,0     POKE 58690,0     POKE 58691,0     POKE 58692,0
POKE 58693,0     POKE 58694,0     POKE 58695,0     POKE 58696,0     POKE 58697,0
POKE 58698,0     POKE 58699,0     POKE 58700,0     POKE 58701,0     POKE 58702,0
POKE 58703,0     POKE 58704,62    POKE 58705,13    POKE 58706,205   POKE 58707,48
POKE 58708,229   POKE 58709,62    POKE 58710,13    POKE 58711,205   POKE 58712,48
POKE 58713,229   POKE 58714,62    POKE 58715,13    POKE 58716,205   POKE 58717,48
POKE 58718,229   POKE 58719,33    POKE 58720,117   POKE 58721,239   POKE 58722,54
POKE 58723,13    POKE 58724,6     POKE 58725,32    POKE 58726,43    POKE 58727,54
POKE 58728,32    POKE 58729,16    POKE 58730,251   POKE 58731,125   POKE 58732,58
POKE 58733,231   POKE 58734,238   POKE 58735,201   POKE 58736,33    POKE 58737,195
POKE 58738,229   POKE 58739,126   POKE 58740,167   POKE 58741,32    POKE 58742,4
POKE 58743,62    POKE 58744,35    POKE 58745,119   POKE 58746,201   POKE 58747,175
POKE 58748,24    POKE 58749,251   POKE 58750,203   POKE 58751,79    POKE 58752,194
POKE 58753,40    POKE 58754,231   POKE 58755,245   POKE 58756,197   POKE 58757,229
POKE 58758,42    POKE 58759,176   POKE 58760,229   POKE 58761,237   POKE 58762,75
POKE 58763,174   POKE 58764,229   POKE 58765,237   POKE 58766,66    POKE 58767,32
POKE 58768,4     POKE 58769,225   POKE 58770,193   POKE 58771,241   POKE 58772,201
POKE 58773,219   POKE 58774,127   POKE 58775,230   POKE 58776,16    POKE 58777,32
POKE 58778,246   POKE 58779,10    POKE 58780,205   POKE 58781,48    POKE 58782,229
POKE 58783,3     POKE 58784,62    POKE 58785,96    POKE 58786,184   POKE 58787,32
POKE 58788,3     POKE 58789,1     POKE 58790,0     POKE 58791,94    POKE 58792,237
POKE 58793,67    POKE 58794,174   POKE 58795,229   POKE 58796,24    POKE 58797,227
POKE 58798,0     POKE 58799,94    POKE 58800,0     POKE 58801,94    POKE 58802,229
POKE 58803,219   POKE 58804,115   POKE 58805,254   POKE 58806,12    POKE 58807,40
POKE 58808,4     POKE 58809,254   POKE 58810,10    POKE 58811,32    POKE 58812,1
POKE 58813,175   POKE 58814,245   POKE 58815,42    POKE 58816,176   POKE 58817,229
POKE 58818,119   POKE 58819,35    POKE 58820,62    POKE 58821,96    POKE 58822,168
POKE 58823,32    POKE 58824,3     POKE 58825,33    POKE 58826,0     POKE 58827,94
POKE 58828,34    POKE 58829,176   POKE 58830,229   POKE 58831,141   POKE 58832,225
POKE 58833,201
```

The BUFFER CON mode should be set to NONE. End printing with CAP SHIFT & BREAK.
To print the BUFFER DATA use V and P options from the MTERM BUFFER MENU.

To toggle the printer ON/OFF while receiving data use CAP SHIFT B and P(PRINT).
Printing is buffered up to 512 bytes to prevent data loss with slower printers.

Over printing will occur if dip switch is not set for CR only, LF not required.
LINE FEEDS and PAGE FEEDS are filtered. To enable the codes POKE 58655 & 58806
to 0 for PAGE FEED or 58653 & 58810 to 0 for LINE FEED.

Your comments appreciated. For questions, send stamped self addressed envelope.

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